

B3

26. (Amended) The display device of claim 1 [comprising] wherein the display is an electroluminescent display.

REMARKS

Claims 1-6 and 20-30 remain for consideration. Claim 31 is canceled without prejudice. Claims 5, 20 and 26 have been amended for clarity. No new matter was introduced by the amendments to the claims.

Election/Restriction

The Examiner indicated that claim 31 was directed to an independent or distinct invention with respect to Group I claims elected in Applicants' Amendment of June 24, 1999. Therefore, the Examiner withdrew claim 31 from consideration. Applicants have canceled claim 31 without prejudice.

Rejections Under 35 U.S.C. §112

The Examiner rejected claims 5, 20 and 26 under 35 U.S.C. §112, second paragraph, as being indefinite. In particular, the Examiner noted that claims 5 and 20 included a second limitation to "a collection of particles," which was ambiguous with respect to the collection of particles recited in the independent claim. Applicants have amended claims 5 and 20 to clarify the relationship of the collection of particles recited in the dependent claims to the original citation of a collection of particles in claim 1. With respect to claim 26, the Examiner noted that it was unclear how the display of claim 1 was related to the electroluminescent display. Applicants have amended claim 26 for clarity. Applicants thank the Examiner for carefully reading the claims. In view of Applicants' amendments of the claims, Applicants respectfully request the withdrawal of the rejection of claims 5, 20 and 26 under 35 U.S.C. §112, second paragraph, as being indefinite.

Rejections Over Jaskie

The Examiner rejected claims 1, 4-6, 20-25 and 27-30 under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent 5,442,254 to Jaskie (the Jaskie patent). In particular, the Examiner noted that

the Jaskie patent discloses a display including phosphor particles having an average diameter less than 100 nm. While the Examiner noted that the Jaskie patent is silent on the particular range of phosphor particles, the Examiner asserted that the Jaskie patent teaches that it is within the skill in the art to specify a desired range of particle sizes. Applicants respectfully request reconsideration of the rejections over the Jaskie patent in view of the following comments.

Assertions in a prior art reference do not support an anticipation or obviousness rejection unless the references place the claimed invention in the hands of the public. Beckman Instruments Inc. v. LKB Produkter AB, 13 USPQ2d 1301, 1304 (Fed. Cir. 1989). "In order to render a claimed apparatus or method obvious, the prior art must enable one skilled in the art to make and use the apparatus or method." Id. While a reference is prior art for all that it teaches, references along with the knowledge of a person of ordinary skill in the art must be enabling to place the invention in the hands of the public. In re Paulsen, 31 USPQ2d 1671, 1675 (Fed. Cir. 1994). See also In re Donohue, 226 USPQ 619, 621 (Fed. Cir. 1985).

The Jaskie patent speculates that a form of "wet filtration" can be used to separate and to prepare particles within a very narrow range of particle sizes. This "wet filtration" evidently is based on analogy to standard chemical chromatography techniques, in particular thin layer chromatography. Chromatography, however, is based on principles that do not apply to the separation of solid particles, whether they are nanoscale or not. In particular, chromatography is based on dissolving compounds to be separated in a solvent. The solvent carries the solutes through the chromatography apparatus while the compound may temporarily leave solution by association, such as by adsorption, with the chromatography substrate.

Thus, **solubility** is a critical requirement for the separation of different compounds by chromatography. The application of an electric field is analogous to electrophoresis, which also requires the solubility of the compounds, whether the compounds are macromolecules, such as proteins or nucleic acids, or other compounds. Chapter 1 from "Introduction to Chromatography" is enclosed, which describes further the how solubility is central to the separation of compound by chromatography.

As a general proposition, chromatography does not separate compounds by molecular weight. Generally, chromatography separates compounds according to ratios of equilibrium constants between different states, such as a liquid state and an adsorbed state. Molecular weight may influence the equilibrium constants, but molecular weight is only one factor among many factors, which depend on the particular separation approach. A particular type of chromatography, gel filtration, separates compounds based on molecular **size**. See page 3 of the enclosed chapter.

Gel filtration makes use of a chromatographic substrate with a particular porosity. Gel filtration, however, still requires a solubilized compound that is divided between two states, its solubilized state and its adsorbed state within the pores of the packing material. Generally, the compound is in equilibrium between these two states. It is the transition between the two states as the solute moves through along the chromatographic material that provides the separation. If the equilibrium is shifted to the adsorbed state, it will move more slowly along the chromatographic material because the compound spends more time in the adsorbed state. Gel filtration does not and cannot work without repeated transitions between a solubilized state and adsorbed state.

The Jaskie patent speculates that chromatographic techniques can be applied to the molecular weight separation of insoluble nanoparticles. This suggestion is highly speculative. First,

nanoparticles tend to form agglomerates that are very difficult to disperse. Without dispersing the nanoparticles, any separation techniques would be separating agglomerates that have a size only indirectly related to the primary particle size. The Jaskie patent does not discuss the issue of particle dispersion.

Furthermore, since the particles are insoluble, no equilibrium is established between a solubilized state and an adsorbed state. Without transitions between these two states, no separation takes place. Perhaps there are other principles for the separation of nanoparticles that replace the chemical separation principles that operate for separating compounds by chromatography, but the Jaskie patent does not indicate what these principles are. If the Jaskie approach is to work, the material used to form the chromatography medium should be critical to the function. The Jaskie patent provides **no guidance** to the selection of appropriate media for the separation. Thus, there are **several explicit deficiencies** in the disclosure of the Jaskie patent.

The Jaskie description seems to be based on an adaption of chemical chromatography techniques to the separation of nanoparticles. The "wet filtering" adaptation, however, is founded on an unfortunate misunderstanding of the principles underlying separation by chemical chromatography. If the technique will ever work, it would require fundamental research in particle dispersion formation, material selection and processing conditions. The Jaskie patent provides no guidance on any of these principles. The amount of research required to practice the techniques suggested in Jaskie patent undoubtedly would be enormous and clearly would be undue experimentation. The techniques may not ever work since the principles required to induce the desired separation are unknown. Thus, there is no reasonable expectation of success that the nanoparticles could be separated by molecular weight. Because of these severe deficiencies, the Jaskie patent does not place the public in possession of Applicants' claimed invention because undue

experimentation is required to practice the invention, and there is no reason to expect the approach to necessarily ever work.

In contrast, Applicants' particle production approach forms a narrow distribution of particle sizes during the formation of the particles. Thus, no separation of the particles is needed. Since the Jaskie patent does not place the public in possession of Applicants' claimed invention, the Jaskie patent does not render Applicants' claimed invention obvious. Applicants respectfully request the withdrawal of the rejection of claims 1, 4-6, 20-25 and 27-30 under 35 U.S.C. §103(a) as being unpatentable over the Jaskie patent.

CONCLUSIONS

In view of the above amendments and remarks, Applicants submit that this application is in condition for allowance, and such action is respectfully requested. The Examiner is invited to telephone the undersigned attorney to discuss any questions or comments that the Examiner may have.

The Commissioner is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

WESTMAN, CHAMPLIN & KELLY, P.A.

By: Peter S. Dardi
Peter S. Dardi, Ph.D., Reg. No. 39,650
Suite 1600 - International Centre
900 Second Avenue South
Minneapolis, Minnesota 55402-3319
Phone: (612) 334-3222 Fax: (612) 339-3312